What is claimed is:

1. A high performance, low core loss bulk magnetic component comprising a plurality of substantially similarly shaped layers of crystalline, ferromagnetic metal strips adhesively bonded together by an adhesive bonding means to form a laminated polyhedrally shaped part, wherein the ferromagnetic metal strips include an iron-base alloy containing 4-11 weight percent Si, and wherein said magnetic component when operated at an excitation frequency "f" to a peak induction level B_{max} has a core-loss less than "L" wherein L is given by the formula $L = 0.0135\ f\ (B_{max})^{1.9} + 0.000108\ f^{1.6}\ (B_{max})^{1.92}$, said core loss, said excitation frequency and said peak induction level being measured in watts per kilogram, hertz, and teslas, respectively.

2. A high performance bulk magnetic component as recited by claim 1, wherein the ferromagnetic metal strips have a composition containing 6-7 weight percent Si.

3. A high performance bulk magnetic component as recited by claim 1, wherein the ferromagnetic metal strips have a composition containing 8-11 weight percent Si and 4-7 weight percent Al.

4. A high performance bulk magnetic component as recited by claim 1, wherein the ferromagnetic metal strips are produced by a process comprising rapid solidification.

5. A high performance bulk magnetic component as recited by claim 1, wherein the ferromagnetic metal strips are produced by a process comprising chemical vapor deposition and diffusion of Si.

6. A high performance bulk magnetic component as recited by claim 1, each of said ferromagnetic metal strips having a saturation induction of at least about 1.7 T.

7. A high performance bulk magnetic component as recited by claim 1, wherein the component has the shape of at least one of a three-dimensional polyhedron with at least one

rectangular cross-section, a three-dimensional polyhedron with at least one trapezoidal cross-section, and a three-dimensional polyhedron with at least one square cross-section.

8. A high performance bulk magnetic component as recited by claim 1, wherein the component includes at least one arcuate surface.

9. A high performance bulk magnetic component as recited by claim 1, wherein the magnetic component has a core-loss of less than or approximately equal to 1 watt-per-kilogram of magnetic metal material when operated at a frequency of approximately 60 Hz and at a flux density of approximately 1.0T.

10. A high performance bulk magnetic component as recited by claim 1, wherein said magnetic component has a core-loss of less than or approximately equal to 20 watts-per-kilogram of magnetic metal material when operated at a frequency of approximately 1,000 Hz and at a flux density of approximately 1.0T.

11. A high performance bulk magnetic component as recited by claim 1, wherein said magnetic component has a core-loss of less than or approximately equal to 105 watts-per-kilogram of magnetic metal material when operated at a frequency of approximately 20,000 Hz and at a flux density of approximately 0.30T.

12. A high performance bulk magnetic component as recited by claim 1, said adhesive bonding means including at least one adhesive selected from the group consisting of epoxies, varnishes, anaerobic adhesives, and room-temperature-vulcanized (RTV) silicone materials.

13. A high performance, low core loss bulk magnetic component comprising a plurality of substantially similarly shaped layers of crystalline, ferromagnetic metal strips adhesively bonded together by an adhesive bonding means to form a laminated polyhedrally shaped part, wherein the ferromagnetic metal strips include an Fe-Ni base alloy containing 35-70 weight percent Ni, and wherein said magnetic component when operated at an excitation frequency "f" to a peak induction level B_{max} has a core-loss less than "L" wherein L is given by the formula L

$= 0.0135\, f\, (B_{max})^{1.9} + 0.000108\, f^{1.6}\, (B_{max})^{1.92}$, said core loss, said excitation frequency and said peak induction level being measured in watts per kilogram, hertz, and teslas, respectively.

14. A high performance bulk magnetic component as recited by claim 13, wherein the ferromagnetic metal strips have a composition with 45-55 weight percent Ni.

15. A high performance bulk magnetic component as recited by claim 13, each of said ferromagnetic metal strips having a saturation induction of at least about 1.2 T.

16. A high performance bulk magnetic component as recited by claim 13, wherein the component has the shape of at least one of a three-dimensional polyhedron with at least one rectangular cross-section, a three-dimensional polyhedron with at least one trapezoidal cross-section, and a three-dimensional polyhedron with at least one square cross-section.

17. A high performance bulk magnetic component as recited by claim 13, wherein the component includes at least one arcuate surface.

18. A high performance bulk magnetic component as recited by claim 13, wherein the magnetic component has a core-loss of less than or approximately equal to 1 watt-per-kilogram of magnetic metal material when operated at a frequency of approximately 60 Hz and at a flux density of approximately 1.0T.

19. A high performance bulk magnetic component as recited by claim 13, wherein said magnetic component has a core-loss of less than or approximately equal to 20 watts-per-kilogram of magnetic metal material when operated at a frequency of approximately 1,000 Hz and at a flux density of approximately 1.0T.

20. A high performance bulk magnetic component as recited by claim 13, wherein said magnetic component has a core-loss of less than or approximately equal to 105 watts-per-kilogram of magnetic metal material when operated at a frequency of approximately 20,000 Hz

and at a flux density of approximately 0.30T.

21. A high performance bulk magnetic component as recited by claim 13, said adhesive bonding means including at least one adhesive selected from the group consisting of epoxies, varnishes, anaerobic adhesives, and room-temperature-vulcanized (RTV) silicone materials.

22. A high performance poleface magnet comprising at least one magnetic component, each magnetic component including a plurality of substantially similarly shaped layers of crystalline, ferromagnetic metal strips bonded together by an adhesive bonding means to form a polyhedrally shaped part wherein said magnetic component when operated at an excitation frequency "f" to a peak induction level B_{max} has a core-loss less than "L" wherein L is given by the formula $L = 0.0135\, f\, (B_{max})^{1.9} + 0.000108\, f^{1.6}\ (B_{max})^{1.92}$, said core loss, said excitation frequency and said peak induction level being measured in watts per kilogram, hertz, and teslas, respectively.

23. A high performance poleface magnet comprising at least one magnetic component, each magnetic component including a plurality of substantially similarly shaped layers of crystalline, ferromagnetic metal strips bonded together by an adhesive bonding means to form a polyhedrally shaped part, wherein the ferromagnetic metal strips include an iron base alloy containing 4-11 weight percent Si, and wherein said magnetic component when operated at an excitation frequency "f" to a peak induction level B_{max} has a core-loss less than "L" wherein L is given by the formula $L = 0.0135\, f\, (B_{max})^{1.9} + 0.000108\, f^{1.6}\ (B_{max})^{1.92}$, said core loss, said excitation frequency and said peak induction level being measured in watts per kilogram, hertz, and teslas, respectively.

24. A high performance poleface magnet as recited in claim 23, wherein the ferromagnetic metal strips have a composition containing 6-7 weight percent Si.

25. A high performance poleface magnet as recited in claim 23, wherein the ferromagnetic metal strips have a composition containing 8-11 weight percent Si and 4-7 weight percent Al.

26. A high performance poleface magnet comprising at least one magnetic component, each magnetic component including a plurality of substantially similarly shaped layers of crystalline, ferromagnetic metal strips bonded together by an adhesive bonding means to form a polyhedrally shaped part, wherein the ferromagnetic metal strips include an Fe-Ni base alloy containing 35-70 weight percent Ni, and wherein said magnetic component when operated at an excitation frequency "f" to a peak induction level B_{max} has a core-loss less than "L" wherein L is given by the formula $L = 0.0135\, f\, (B_{max})^{1.9} + 0.000108\, f^{1.6}\, (B_{max})^{1.92}$, said core loss, said excitation frequency and said peak induction level being measured in watts per kilogram, hertz, and teslas, respectively.

27. A high performance poleface magnet as recited in claim 26, wherein the ferromagnetic metal strips have a composition containing 45-55 weight percent Ni.

28. A method of constructing a high performance bulk magnetic component comprising:

(a) cutting crystalline, ferromagnetic metal strip material comprised of at least an iron base alloy containing 4-11 weight percent Si to form a plurality of strips having a predetermined length;

(b) stacking the strips to form a bar of stacked ferromagnetic metal strip material;

(c) impregnating the stacked bar with an adhesive bonding means and activating the adhesive bonding means to laminate the cut strips; and

(d) cutting the stacked bar at predetermined lengths to provide a plurality of polyhedrally shaped magnetic components.

29. The method of claim 28, wherein the iron base alloy contains 6-7 weight percent Si.

30. The method of claim 28, wherein step (d) comprises cutting the stacked bar using a cutting means including at least one of a cutting blade, a cutting wheel, a water jet, an electro-chemical grinding machine, and an electro-discharge machine.

31. A method of constructing a high performance bulk magnetic component comprising:

(a) cutting crystalline, ferromagnetic metal strip material comprised of at least an iron base alloy containing 4-11 weight percent Si to form a plurality of strips having a predetermined length;

(b) stacking the strips to form a bar of stacked ferromagnetic metal strip material;

(c) impregnating the stacked bar with an adhesive bonding means and activating the adhesive bonding means to laminate the cut strips; and

(d) cutting the stacked bar at predetermined lengths to provide a plurality of polyhedrally shaped magnetic components, wherein said low-loss high performance bulk magnetic component when excited at a frequency f to a peak induction level B_{max} has a core-loss less than L wherein L is given by the formula $L = 0.0135\, f\, (B_{max})^{1.9} + 0.000282\, f^{1.6}\, (B_{max})^{1.92}$, said core loss, said excitation frequency and said peak induction level being measured in watts per kilogram, hertz, and teslas, respectively.

32. The method of claim 31 wherein the iron base alloy contains 6-7 weight percent Si.

33. A method of constructing a high performance bulk magnetic component comprising:

(a) winding crystalline, ferromagnetic metal strip material comprised of at least an iron base alloy containing 4-11 weight percent Si about a mandrel to form a generally rectangular core having generally radiused corners;

(b) impregnating the generally rectangular core with an adhesive bonding means and activating the adhesive bonding means to laminate the layers;

(c) cutting the short sides of the generally rectangular core to form two polyhedrally shaped magnetic components;

(d) removing the generally radiused corners from the long sides of the generally rectangular core; and

(e) cutting the long sides of the generally rectangular core to form a plurality of magnetic components.

34. The method of claim 33, wherein the iron base alloy contains 6-7 weight percent Si.

35. The method of claim 33, wherein at least one of steps (c) and (e) comprises cutting ferromagnetic metal strip material using at least one of a cutting blade, a cutting wheel, a water jet, an electro-chemical grinding machine, and an electro-discharge machine.

36. A high performance bulk magnetic component constructed in accordance with the method of claim 33, wherein the low-loss high performance bulk magnetic component when excited at a frequency f to a peak induction level B_{max} has a core-loss less than L wherein L is given by the formula $L = 0.0135\, f\, (B_{max})^{1.9} + 0.000108\, f^{1.6}\, (B_{max})^{1.92}$, said core loss, said excitation frequency and said peak induction level being measured in watts per kilogram, hertz, and teslas, respectively.

37. A method of constructing a high performance bulk magnetic component comprising the steps of:

(a) stamping crystalline, ferromagnetic metal strip feedstock comprised of at least an iron base alloy containing 4-11 weight percent Si to form a plurality of laminations having a predetermined shape;

(b) stacking and registering the laminations to form a stack having a three-dimensional shape; and

(c) applying and activating adhesive means to adhere the laminations to each other to form the component, wherein the component when operated at an excitation frequency "f" to a peak induction level B_{max} has a core-loss less than "L" wherein L is given by the formula $L = 0.0135\, f\, (B_{max})^{1.9} + 0.000108\, f^{1.6}\, (B_{max})^{1.92}$, said core loss, said excitation frequency and said peak induction level being measured in watts per kilogram, hertz, and teslas, respectively.

38. The method of claim 37, wherein the iron base alloy contains 6-7 weight percent Si.

39. The method of claim 37, further comprising finishing the component to achieve at least one of removing excess adhesive, giving the component a suitable surface finish, and giving the component its desired component dimensions.

40. A method of constructing a high performance bulk magnetic component comprising:

(a) cutting crystalline, ferromagnetic metal strip material comprised of at least an Fe-Ni base alloy containing 35-70 weight percent Ni to form a plurality of strips having a predetermined length;

(b) stacking the strips to form a bar of stacked ferromagnetic metal strip material;

(c) impregnating the stacked bar with an adhesive bonding means and activating the adhesive bonding means to laminate the cut strips; and

(d) cutting the stacked bar at predetermined lengths to provide a plurality of polyhedrally shaped magnetic components.

41. The method of claim 40, wherein the Fe-Ni base alloy contains 45-55 weight percent Ni.

42. The method of claim 40, wherein step (d) comprises cutting ferromagnetic metal strip material using at least one of a cutting blade, a cutting wheel, a water jet, an electro-chemical grinding machine, and an electro-discharge machine.

43. A method of constructing a high performance bulk magnetic component comprising:

(a) cutting crystalline, ferromagnetic metal strip material comprised of at least an Fe-Ni base alloy containing 35-70 weight percent Ni to form a plurality of strips having a predetermined length;

(b) stacking the strips to form a bar of stacked ferromagnetic metal strip material;

(c) impregnating the stacked bar with an adhesive bonding means and activating the adhesive bonding means to laminate the cut strips; and

(d) cutting the stacked bar at predetermined lengths to provide a plurality of polyhedrally shaped magnetic components, wherein said low-loss high performance bulk magnetic component when excited at a frequency f to a peak induction level B_{max} has a core-loss less than L wherein L is given by the formula $L = 0.0135\, f\, (B_{max})^{1.9} + 0.000282\, f^{1.6}\, (B_{max})^{1.92}$, said core loss, said excitation frequency and said peak induction level being measured in watts per kilogram, hertz, and teslas, respectively.

44. The method of claim 43, wherein the Fe-Ni base alloy contains 45-55 weight percent Ni.

45. A method of constructing a high performance bulk magnetic component comprising:

(a) winding crystalline, ferromagnetic metal strip material comprised of at least an Fe-Ni base alloy containing 35-70 weight percent Ni about a mandrel to form a generally rectangular core having generally radiused corners;

(b) impregnating the generally rectangular core with an adhesive bonding means and activating the adhesive bonding means to laminate the layers;

(c) cutting the short sides of the generally rectangular core to form two polyhedrally shaped magnetic components;

(d) removing the generally radiused corners from the long sides of the generally rectangular core; and

(e) cutting the long sides of the generally rectangular core to form a plurality of magnetic components.

46. A high performance poleface magnet as recited in claim 45, wherein the Fe-Ni base alloy contains 45-55 weight percent Ni.

47. The method of claim 45, wherein at least one of steps (c) and (e) comprises cutting ferromagnetic metal strip material using at least one of a cutting blade, a cutting wheel, a water jet, an electro-chemical grinding machine, and an electro-discharge machine.

48. A high performance bulk magnetic component constructed in accordance with the method of claim 45, wherein the low-loss high performance bulk magnetic component when excited at a frequency f to a peak induction level B_{max} has a core-loss less than L wherein L is given by the formula $L = 0.0135\, f\, (B_{max})^{1.9} + 0.000108\, f^{1.6}\, (B_{max})^{1.92}$, said core loss, said excitation frequency and said peak induction level being measured in watts per kilogram, hertz, and teslas, respectively.

49. A method of constructing a high performance bulk magnetic component comprising the steps of:

(a) stamping crystalline, ferromagnetic metal strip feedstock comprised of at least an Fe-Ni base alloy containing 35-70 weight percent Ni to form a plurality of laminations having a predetermined shape;

(b) stacking and registering the laminations to form a stack having a three-dimensional shape; and

(c) applying and activating adhesive means to adhere the laminations to each other to form the component, wherein the component when operated at an excitation frequency "f" to a peak induction level B_{max} has a core-loss less than "L" wherein L is given by the formula $L = 0.0135\, f\, (B_{max})^{1.9} + 0.000108\, f^{1.6}\, (B_{max})^{1.92}$, said core loss, said excitation frequency and said peak induction level being measured in watts per kilogram, hertz, and teslas, respectively.

50. The method of claim 49, further comprising finishing the component to achieve at least one of removing excess adhesive, giving the component a suitable surface finish, and giving the component its desired component dimensions.